



## Water Quality

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**Treatment  
Sampling  
Monitoring**  
Department of Public Works  
Helena Water Treatment Division



# 2003 Annual Water Quality Report

**The goal of the Helena Water Division is to ensure customer satisfaction by consistently delivering high quality water today and in the future.**

The Helena Water Treatment Division provides more than 29,000 customers with a yearly average of 4.9 million gallons of water each day. Our water system supplies water directly to homes and businesses throughout Helena. Water is delivered to the City's fire hydrants, to ensure the safety of our residents. The water distribution system connects to 9,300 service taps. The total annual gallorage from all sources for 2002 is 1.775 Billion Gallons with a peak day of 11.7 Million Gallons.

In 2002, the Helena Water Division once again met all state and federal standards for clean water. We are pleased to offer this report to the community detailing the workings of our division and the results of the testing.

**Water System --** To meet Helena's daily water needs, the Helena Water Treatment Division of the Department of Public Works operates two surface water treatment plants--the Missouri River Water Treatment Plant located at 2560 Canyon Ferry Road, whose source is the Missouri River east of Helena and the Tenmile Water Treatment Plant west of Helena at 1115 Rimini Road, whose source is the Tenmile Creek drainage west of Helena. The Tenmile Water Plant is in operation year round while the MRTP is used during the summer months for peak demands and for the primary water supply during drought conditions throughout the year. We obtain additional water from the Hale system, which consists of the Oro Fino collector located southwest of Helena in the Oro Fino Gulch area and the Eureka well collector located at Cruse and Park Streets. The division's two treatment plants are maintained, evaluated, and upgraded to stay abreast of advancements in technology, health science, and governmental regulations.

The Helena water system consists of six finished water storage reservoirs (Malben, Winne, Hale, Upper Hale, Nob Hill, and Woolston) and four pumping stations (Hale, Eureka, Dahlhausen, and Nob Hill) and two booster stations (Reeder's Village and Forrest Estates) linked together with 185 miles of water transmission and distribution pipelines. The Chessman (530 MG) and Scott (195 MG) reservoirs in the Tenmile watershed provide storage water for the Tenmile Water Plant during low stream flows. These reservoirs are filled with spring run off water.

Carollo Engineers of Boise, Idaho, completed a Water Master Plan Update for the City of Helena in April 1997. The Department of Public Works has copies of the Water Master Plan available for public review. Phase One of this update determined that the existing Missouri River Treatment Plant should be rehabilitated or replaced due to age of equipment, public health risks, and operational safety issues. HDR Consulting Engineers has been hired to assist and begin the MRTP rehabilitation. This rehabilitation will be phased in and completed during the next ten years.

Work has been completed on the upper East side of Helena with the installation of a new 4.0 MG reservoir, pumping station, and additional supply pipelines increasing the service area and improving fire protection. Phase One work at the MRTP included installation of a variable speed drive, which increased the output capacity and improved the energy efficiency. One of the eight filters was rehabilitated as the filter had failed. Future MRTP projects include rehabilitation of the remaining filters, which includes adding air scrubbers and filter-to-waste that assures the highest quality water is produced. Future improvements will include a new pump station, clearwell, carbon storage, and carbon feeder facility.

**Water Plant Treatment --** This process consists of a series of steps. First aluminum sulfate and cationic polymer are added to the influent water, causing small particles to adhere to each other and making them heavy enough to settle into a basin from which sediment is removed. At the Tenmile Water Plant these particles attach to small plastic media. The particles as sediment are then flushed to waste lagoons. The water is then filtered through layers of fine coal and silicate sand removing the suspended particles. A disinfectant (chlorine) is added after filtration to our clear well. During filtration turbidity is removed and clear water emerges. Prior to the water being sent to town, a small amount of chlorine is added again to ensure the water remains free of any virus or bacteria.

**Sampling --** The highly trained staff at the water treatment plants initiates this process. Sampling includes the following:

Daily	Chlorine residuals, turbidity, pH, temperature, and color.
Weekly	Bacteria (total coliform).
Quarterly	Trihalomethanes.
Yearly	Inorganic, volatile organic contaminants, synthetic organic contaminants, nitrates, lead and copper (every 3 years), radioactivity (every 4 years).

**Monitoring --** both the State Environmental Lab (Cogswell Building) and the Energy Lab in Helena are the heart of our quality assurance program. Their testing by certified chemists and technicians follows precise procedures established by the U.S. Environmental Protection Agency (EPA). Their web site is at <http://www.epa.gov> for review.

Listed below are the substances, **which were detected** and analyzed, by the State Environmental Lab and the Energy Lab for the Helena Water Division. The maximum contaminated levels (MCL) apply to the water within our distribution system after treatment including groundwater sources. This table shows the results of our monitoring for the period of January 1 to December 31, 2002.

## Tenmile, MRTP, Hale/Eureka Water Sources

<b>TEST RESULTS</b>								
Contaminant	Violation Y/N	Sample Date	Highest Level Detected	Range Detected	Unit Measurement	MCLG	MCL	Likely Source of Contamination
<b>Microbiological Contaminants</b>								
1. Turbidity Tenmile Water Plant Missouri River Water Plant	N N	May 05, 02 June 28, 02	<b>0.29</b> <b>0.26</b>	100% of samples taken meet state requirements	NTU	NA	TT	Soil runoff.
<b>Inorganic Contaminates</b>								
2. Copper	N	Sept.08, 02	<b>0.42</b> 90th % of samples taken	No samples exceeded the Action Level.	ppm	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives.
3. Lead	N	Sept. 08, 02	<b>6</b> 90th % of samples taken	No samples exceeded the Action Level.	ppb	0	AL=15	Corrosion of household plumbing systems; erosion of natural deposits.
4. Nitrate plus Nitrite as N Tenmile Water Plant Hale / Eureka	N N  N N	July 17, 02 July 19, 02  July 19, 02 July 19, 02	<b>0.07</b> <b>0.93</b>  <b>0.13</b> <b>1.16</b>		ppm   ppm	10   4	10   4	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
5. Fluoride Tenmile Water Plant Missouri River Water Plant Hale / Eureka	N	July 19, 02	<b>0.11</b>					Erosion of natural deposits; discharge from fertilizer and aluminum factories
<b>Volatile Organic Contaminants (voc's)</b>								
6. Total Trihalomethanes  Tenmile Water Plant Missouri River Water Plant Hale/Eureka	N N  N	Yearly avg. Yearly avg.  Yearly avg.	<b>35.0</b> <b>35.0</b>  <b>5.0</b>	22.0 – 51.0 19.0 - 51.0  3.0 – 13.0	ppb		80.0 Yearly avg.	By-product of drinking water chlorination.

Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. The specified limit for our treatment process is 0.3 NTU in the clearwell and our turbidity measurements were less

than this amount 100% of the time.

As you can see by the table, our system had no violations. We are proud that your drinking water meets or exceeds all federal and state requirements. We have learned through our monitoring and testing that some contaminants have been detected and are listed in the above test results. The EPA has determined that your water IS SAFE at these levels.

We constantly monitor the water supply for various constituents. We have detected radon in all surface and ground water sources. The radon detection ranged from a low of 220 pCi/L to a high of 1770 pCi/L. Radon is a radioactive gas that you can't see, taste, or smell. It normally is found underground and can move up through the ground and into a home through cracks and holes in the foundations. The EPA is proposing an MCL of 300 pCi/L in drinking water with an alternative MCL of 4000 pCi/L for those systems or states that implement a Multi-Media Mitigation Program, which is a public awareness program. **There is no federal regulation for radon levels (MCL) in drinking water as of this printing.** This drinking water is defined as groundwater or a blend of surface and groundwater. Exposure to air transmitted radon over a long period of time may cause adverse health effects. For additional information call the state radon program at 444-5318 or call the EPA's Radon Hotline (1-800-SOS-RADON).

Additional testing of our drinking water was taken by the EPA on April 28, 2000. These samples were taken during a period of high turbidity commonly seen in the early spring. During this period velocities increase several fold resulting in scouring in the distribution system. All samples taken were within compliance of all EPA and state drinking water regulations.

\*Abbreviated Definitions:

AL	Action level. The concentration of a contaminant, which if exceeded, triggers treatment or other requirements which a water system must follow.
NA	Not Available.
BG	Billion Gallons.
MG	Million Gallons.
TT	Treatment Technique. Required process intended to reduce the level of a contaminant in drinking water.
ppm or mg/L	Parts Per Million. One part per million corresponds to one minute in two years or a single penny in \$10,000.
ppb	Parts Per Billion. One part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.
NTU	Nephelometric Turbidity Unit. A measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
pCi/L	Picocuries per liter--measure of radioactivity in water.
MCL	Maximum Contaminant Level. Highest allowable amount of a contaminant that is allowed in drinking water.
MCLG	Maximum Contaminant Level Goal. Level of a contaminant in drinking water below which no known or expected risk to health exists. MCLG's allow for a margin of safety

All sources of drinking water are subject to potential contamination by constituents that are naturally occurring or man made. Those constituents can be microbes, organic or inorganic chemicals, or radioactive materials.

All drinking water including bottled water may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the **Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791**.

The MCL's are set by the USEPA and State of Montana at levels which assure public health and safety with a very low risk of health impacts.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The EPA and Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the **Safe Drinking Water Hotline (1-800-426-4791)**.

If you have any questions about this report or concerning your water utility, please contact Leonard Willett, Water/Wastewater Treatment Superintendent at 447-1593 or Fax 447-1600 or e-mail [Lwillett@ci.helena.mt.us](mailto:Lwillett@ci.helena.mt.us). We want our valued customers to be informed about their water utility. If you want to learn more, please attend any of our regularly scheduled meetings. They are held in the City Commission Chambers Monday evenings at 6 p.m., located in the City/County building at 316 North Park Avenue. You can visit our web site at <http://www.ci.helena.mt.us/> for additional information.

Prepared and updated April 1, 2003 by  
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